

NONPARAMETRIC CORRELATION ANALYSIS: SPEARMAN'S RANK CORRELATION

Homework 11: BI 311

Introduction:

We will continue our examination of non-parametric statistical analysis by applying Spearman's Rank Correlation which is fully explained in Ambrose et al (2007). This analysis can be used in place of parametric regression analysis.

Skills:

1. Practice calculating Spearman Rank Correlation coefficient.
2. Use a Critical Values table to test for significant correlations.

Materials:

1. Access to EXCEL
 2. EXCEL file named *Homework 11*
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EXERCISE 1- ESTIMATING SPEARMAN'S RANK CORRELATION COEFFICIENT

Background:

From page 50 of Ambrose et al (2007) you can see that Spearman's Rank Correlation is used whenever you want to test for associations between two continuous variables. In other words, it can be used whenever a regression analysis is appropriate. Sometimes, when the data are not normally distributed, Spearman's Rank Correlation can work better than regression.

Recall from homework 6 that you performed regression analysis to test for an association between patch-size and abundance for the Florida scrub lizard. You may also recall that patch size was not normally distributed. We had to take the ln of patch size to fit a normal distribution and tested for associations between ln of patch-size and abundance. Alternatively, as we will do here, you can use Spearman's Rank Correlation.

Laboratory Procedure:

1. Pages 82 – 84 of Ambrose et al. describe how to perform a Spearman's Rank Correlation. Read through the examples to understand how to complete the exercise. Spearman's Rank Correlation can easily be computed with a hand calculator or a spreadsheet. I have constructed a spreadsheet in EXCEL that should speed up the calculations. In table 1 (the worksheet labeled *height v weight*) of the *Homework 11* EXCEL file you will find the same data as on page 82 of Ambrose et al. (2007). Read through the example and make sure you understand the conclusions.
 2. Repeat calculations for Spearman's Rank Correlation for each subsequent table (tables 2-4) in the spreadsheet file.
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HOMWORK SUBMISSION

1. For your homework, create a WORD file named *Homework 11* and report your answers for the following questions:
 - a. What is the Spearman's Rank Correlation coefficient for patch area versus scrub lizard abundance?
 - b. Is the correlation between patch area and abundance statistically significant?
 - c. What is the Spearman's Rank Correlation coefficient for patch area versus scrub lizard recruitment?
 - d. Is the correlation between patch area and recruitment statistically significant?
 - e. What is the Spearman's Rank Correlation coefficient for cartoon score versus limerick score?
 - f. Is the correlation between cartoon score and limerick score statistically significant?